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IS 11918 (1987): Method for Determination of pH in Caseins and Caseinates (Reference Method) [FAD 19: Dairy Products and Equipment]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

(Reaffirmed 2003)

METHOD FOR DETERMINATION OF pH IN CASEINS AND
CASEINATES (REFERENCE METHOD)

[ISO Title : Caseins and Caseinates — Determination
of pH (Reference Method)]

National Foreword

This Indian Standard which is identical with ISO 5546 - 1978 'Caseins and caseinates — Determination of pH (Reference method)', issued by the International Organization for Standardization (ISO), was adopted by the Indian Standards Institution on the recommendation of the Dairy Products Sectional Committee and approval of the Agricultural and Food Products Division Council.

In the adopted standard, certain terminology and conventions are not identical with those used in Indian Standard; attention is particularly drawn to the following:

- a) Wherever the words 'International Standard' appear, referring to this standard, they should be read as 'Indian Standard'; and
- b) Comma (,) has been used as decimal marker while in Indian Standards, the current practice is to use point (.) as the decimal marker.

Cross References

International Standard	Corresponding Indian Standard
ISO/R 707 (ISO 707-1985) Milk and milk products — Methods of sampling	IS : 11546-1985/ISO 707-1985 Methods of sampling of milk and milk products (Identical)
ISO/3310/1 Test sieves—Technical requirements and testing — Part 1 Metal wire cloth	IS : 460 (Part 1) - 1985 Specification for test sieves : Part 1 Wire cloth test sieves (third revision) (Technically equivalent)

For determining compliance with the test requirements prescribed in the standard, result of a test or analysis shall be rounded off in accordance with IS : 2-1960 'Rules for rounding off numerical values (revised)'.

Dairy Products Sectional Committee, AFDC 34 [Ref : Doc : AFDC 34 (2850)]

1 Scope and field of application

This International Standard specifies a reference method for the determination of the pH of all types of casein (acid caseins and rennet caseins) and of caseinates.

2 References

ISO/R 707, *Milk and milk products — Sampling*.

ISO 3310/1, *Test sieves — Technical requirements and testing — Part 1 : Metal wire cloth*.

3 Definition

pH of caseins and caseinates : The pH, at 20 °C, of an aqueous extract of casein or an aqueous solution of caseinate, as determined by the procedure described in this International Standard.

4 Principle

Electrometric determination of the pH of an aqueous extract of casein or an aqueous solution of caseinate, using a pH meter.

5 Reagents

The reagents shall be of recognized analytical grade. Any water used in their preparation and the water used in the determination (8.2) shall be recently distilled water that has been protected from carbon dioxide absorption.

5.1 Buffer solutions, for calibration of the pH meter (6.2).

Two standard buffer solutions with pH values at 20 °C which are known to the second decimal place and will bracket the pH value of the sample under test, for example phthalate buffer solution of pH approximately 4 and a borax buffer solution of pH approximately 9. In addition, a phosphate buffer solution of pH approximately 7 may be used.

6 Apparatus

6.1 Balance, accuracy 0,1 g.

6.2 pH meter, minimum sensitivity 0,05 pH unit, with a suitable glass electrode and a calomel or other reference electrode.

6.3 Thermometer, accuracy 0,5 °C.

6.4 Conical flask, capacity 100 ml, fitted with a ground glass stopper.

6.5 Beaker, capacity 50 ml.

6.6 Grinding device, for grinding the laboratory sample, if necessary (see 8.1.4), without development of undue heat and without loss or absorption of moisture. A hammer-mill shall not be used.

6.7 Test sieve, wire cloth, diameter 200 mm, nominal size of aperture 500 µm, with receiver, complying with ISO 3310/1.

6.8 Mixer.

6.9 Beaker, for the mixer (6.8), of at least 250 ml capacity.

7 Sampling

See ISO/R 707.

8 Procedure

8.1 Preparation of the test sample

8.1.1 Thoroughly mix the laboratory sample by repeatedly shaking and inverting the container (if necessary, after having transferred all of the laboratory sample to an air-tight container of sufficient capacity to allow this operation to be carried out).

8.1.2 Transfer about 50 g of the thoroughly mixed laboratory sample to the test sieve (6.7).

8.1.3 If the 50 g portion directly passes or almost completely passes the sieve, use for the determination the sample as prepared in 8.1.1.

8.1.4 Otherwise, grind the 50 g portion, using the grinding device (6.6), until it passes the sieve. Immediately transfer all the sieved sample to an air-tight container of sufficient capacity and mix thoroughly by repeated shaking and inverting. During these operations, take precautions to avoid any change in the water content of the product.

8.1.5 After the test sample has been prepared, the determination (8.2) should be proceeded with as soon as possible.

8.2 Determination

8.2.1 Calibration of pH meter

Adjust the temperature of the buffer solutions (5.1) to 20 °C and calibrate the pH meter in accordance with the manufacturer's instructions.

NOTES

1 The calibration should be carried out while the flasks are standing for 20 min (see 8.2.2.1 and 8.2.2.2).

2 If a series of samples is being tested, check the calibration of the pH meter with one or more of the standard buffer solutions at least every 30 min.

8.2.2 Preparation of test solution

8.2.2.1 Caseins

Weigh to the nearest 0,1 g, into the conical flask (6.4), 5,0 g of the test sample (8.1), add 30 ml of water previously adjusted to 20 °C and stopper the flask. (If desired, 7,0 g of the test sample and 42 ml of water can be taken.)

Shake the flask by hand for 10 s and allow to stand for 20 min at about 20 °C.

8.2.2.2 Caseinates

Transfer to the beaker (6.9) 95 ml of water, add 5,0 g of the test sample (8.1), and mix using the mixer (6.8) for 30 s.

Allow to stand for 20 min at about 20 °C.

8.2.3 Measurement of pH

8.2.3.1 Caseins

Decant the supernatant liquid into the beaker (6.5) and immediately determine the pH of this liquid, using the pH meter (6.2), after having rinsed the glass electrode carefully with water.

8.2.3.2 Caseinates

Pour about 20 ml of the solution into the beaker (6.5) and immediately determine the pH of this liquid, using the pH meter (6.2), after having rinsed the glass electrode carefully with water.

9 Expression of results

9.1 Recording of pH

9.1.1 Caseins

Record, as the pH of the aqueous extract of casein, the value read from the dial of the pH meter to at least one decimal place.

9.1.2 Caseinates

Record, as the pH of the aqueous solution of caseinate, the value read from the dial of the pH meter to at least two decimal places.

9.2 Precision

9.2.1 Repeatability

The difference between two single results obtained on identical test material by one analyst using the same apparatus within a short time interval will exceed 0,1 pH unit for casein extracts and 0,05 pH unit for caseinate solutions on average not more than once in 20 cases in the normal and correct operation of the method.

9.2.2 Reproducibility

The difference between two single and independent results obtained by two operators working in different laboratories on identical test material will exceed 0,3 pH unit for casein extracts and 0,15 pH unit for caseinate solutions on average not more than once in 20 cases in the normal and correct operation of the method.

10 Test report

The test report shall show the method used and the result obtained, it shall also mention all operating conditions not specified in this International Standard, or regarded as optional, as well as any circumstances that may have influenced the result.

The report shall include all details necessary for complete identification of the sample.